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CIRCON microTechnology

MV 9600 microVideo

Metrology System

- **Efficient**
  - —Reduced Operator Strain
  - —Digital Read Out
  - —Hard Copy Print Out
- **Economical**
  - —High Speed Measurement
  - —Moderate Cost
  - —No Microscope Required
- **Accurate**
  - —Any Power Magnification
  - —Error ± 0.1%
  - —Correct Dimensional Units
- **Integrated System**
  - —Simple to Operate
  - —Nothing Else to Buy

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CIRCON's MV 9600 MicroVideo Metrology System is a general purpose instrument designed to provide fast, semi-automatic measurement of subjects requiring magnification. The system incorporates all of the quality components required for precision measurement including:

- High Resolution Camera
- Complete Optical System
- Adjustable Camera Platform
- Illumination System
- Solid State Monitor
- Control Console
- Digital Read-Out
- Hard Copy Print-Out

The principle of the MicroVideo Metrology System is that any subject displayed on a television monitor at any power of magnification can be measured by an adjustable, calibrated Bright Line. The system is semi-automatic in that the operator must position the subject and the Bright Line, but once calibrated, the system will instantly read out any dimension of the subject overlaid by the Bright Line.

The electronically generated Bright Line can be positioned anywhere on the screen and its length varied by dial controls. Extending or contracting the length of the Bright Line automatically increases or decreases the dimensioned number on the Digital Read-Out and the Hard Copy Print-Out.

The primary advantages of the MV 9600 MicroVideo Metrology System over the use of a measuring microscope are:

1. Higher speed inspection and measurement.
2. Reduction of operator strain and error by replacement of the microscope eyepiece with a television screen.
3. Digital Read-Out in the correct dimensional units with a decimal point.
4. Hard Copy Print-Out in the correct dimensional units.
5. Image magnification by both optical and electronic means — allowing the system to deliver 40% greater working distance and depth of field than is possible with any microscope.

The integrated MicroVideo System is engineered to provide a compact, versatile work station suitable for a wide variety of activities including miniature assembly, inspection and repair operations. A variable speed control activates the power movement of the MicroOptical System vertically to focus on the work viewed. The entire MicroVideo System occupies less than 1.5 square feet of bench space yet provides a complete work station incorporating illumination, magnification, and variable speed power focusing.

The MicroVideo Metrology System may incorporate either a three lens turret or a 5:1 Zoom Micro Optical System. Both systems provide cool high intensity fiber optic illumination.

CIRCON's Turret MicroOptical System is suitable for a wide variety of inspection and production tasks. Large machine parts may be measured and inspected for surface characteristics and tolerance at magnifications less than ten power. By simply rotating the turret lens assembly, 30 power magnification is achieved which is suitable for miniature assembly work or printed circuit board inspection. At 100 power integrated circuits may be easily inspected, measured and repaired. With several hundred power magnification the grain structure and faults invisible to the eye may be detected and quantified.

MV 9600 MicroVideo Metrology System $5950.
Including one Interchangeable MicroOptical System.

The Zoom MicroOptical System provides a constant working distance of 3.75 inches while magnification is varied through a 5:1 range. The parfocal zoom lens system permits variations in magnification without the need to refocus each time the power of magnification is changed. Inspection or assembly may be accomplished under lower power and then, without disturbing the subject or losing sharpness of focus, more detailed inspection may be accomplished by zooming to higher magnification.

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CIRCON MV 9600 microVideo Metrology System

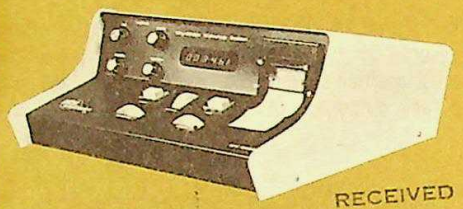
SYSTEM OPERATION

The MicroVideo Metrology System provides rapid, accurate, horizontal measurement of any subject at any power of magnification. This is accomplished by electronically overlaying a calibrated Bright Line on the magnified video image of a subject. The Bright Line is calibrated to read horizontal measurements in the correct dimensional units.

The system is operated as follows:

1. Select the proper magnification and focus on an appropriate scale (ruler, scribed lines, etc.) under the MicroOptical System.
2. Dial a known dimension of the scale onto the Digital Read-Out and position the Bright Line over that distance on the scale. The system is now fully calibrated.
3. Remove the scale and focus on the subject. Position the Bright Line over the horizontal distance to be measured. The Digital Read-Out measurement will automatically vary with the length of the Bright Line.

MV 9605
Metrology Console



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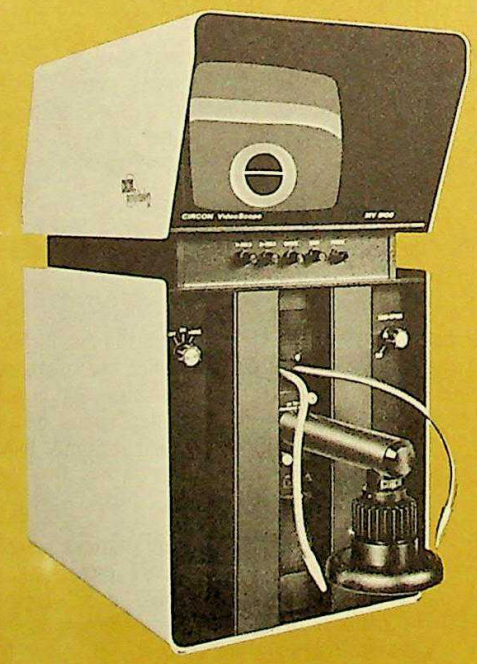
The Metrology Console incorporates a solid state Digital Read-Out, a hard copy Printer and all controls for operation of the Metrology System. Both the positioning and the length adjustments of the Bright Line on the screen are accomplished simultaneously by simple, one hand controls. Any horizontal distance may be measured by varying the length of the calibrated Bright Line. The dimension in correct units with proper decimal location instantaneously appears on the Digital Read-Out. A hard copy Print-Out is activated by a push-button control for a permanent record of the measurement.

Once the Bright Line is calibrated, the system need not be recalibrated so long as the power of magnification is not changed. Measurements taken over the same distance as the calibration length have 99.9% accuracy. Measurements 50% larger or smaller than the calibration length are accurate to 99.5%.

- High Resolution Camera
- MicroOptical System
- MicroFiber Optic Illuminator
- Adjustable Camera Platform



CIRCON's MicroVideo Metrology System incorporates a high resolution synchronized 2:1 interlace camera, an advanced solid state Video Monitor, a MicroOptical System which replaces the conventional microscope, a high intensity MicroFiber Optic Illuminator and an Adjustable Camera Platform. Each of these components has been selected for superior performance and reliable service.

CIRCON's MV 9505 Turret MicroOptical System is engineered specifically for Closed Circuit Television microscope work. The system includes:

- 10x Widefield Eyepiece
- 1x, 3x, and 10x Objective Lenses
- Three Lens Rotating T-Turret Assembly
- Fiber Optic Adaptor Assembly
- Fine Focus Control
- Adjustable Camera Platform

Since the system is designed to accept standard microscope lenses, CIRCON can supply any other eyepiece or objective lens combination desired, including the MV 9555 Zoom MicroOptical System.

A distinctive feature of the MicroOptical System is that the image is magnified electronically 40%. For example, if the MicroOptical System magnifies the image 100 times, the subject appears 140 times actual size on the monitor screen, yielding 40% greater working distance and depth of view than is possible with a microscope of equal power.

Cool, brilliant illumination is provided by a high intensity light source through a Fiber Optic Light Guide. The entire field is evenly illuminated with up to 8000 foot candles of light for maximum clarity. Through internal optics the light is projected down the lens system onto the subject. The intensity is controllable by dial settings, but the temperature of the subject is never raised, even at the maximum level.

CIRCON's solid state, high performance television camera has proven to be the finest of its class for high power microscope applications. With a guaranteed video standard resolution in excess of 600 lines and a built-in Automatic Light Control circuit it offers a better reproduction, more versatility and a longer life of service than many higher priced television cameras on the market. An internal sync pulse generator supplies a synchronized 2:1 interlace scanning system for maximum stability. Utilizing the variable vidicon positioning system, the camera can produce 2:1 zoom magnification electronically.

WARRANTY

The MV 9600 MicroVideo Metrology System is guaranteed to be free from defects in material and workmanship under normal usage for one year. This includes all parts and labor except the lamp for the MicroFiber Optic Light Source and Vidicon tube. The Vidicon tube has a 90 day warranty.

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CIRCON microTechnology

MV 9631 microVideo

Metrology System

- **Efficient**
  - —Reduced Operator Strain
  - —Digital Readout
  - —High Speed Measurement
- **Versatile**
  - —40 to 800 power
  - —For Inspection or Measurement
- **Accurate**
  - —Any Power Magnification
  - —99.9% Accuracy
  - —Correct Dimensional Units
- **Integrated System**
  - —Simple to Operate
  - —Nothing Else to Buy

CIRCON's MV 9631 MicroVideo Metrology System is a sophisticated yet easy to use measuring instrument which meets the requirements of modern quality control and production processes. It offers all the features of an integrated closed circuit television microscope system plus two measuring systems which give the highest degree of electronic and mechanical accuracy.

The system has all the quality components required for precision measurement of small parts under magnification by two techniques. These include:

- Electronic Measuring System
- Digital Micrometer Stage
- High Resolution Camera
- Solid State Monitor
- Turret MicroOptical System
- Two Illumination Systems

The first measuring technique utilizes two parallel lines, each of which may be moved independently. Measurement is accomplished by positioning the lines at either end of the subject and then viewing the dimension on the digital readout.

Since the parallel lines remain vertical on the screen, oblique dimensions of the subject are measured either by rotating the subject or adjusting the image rotation control.

The variable intensity lines are very sharp and are dashed so that they may be positioned exactly on the edge of the subject being measured, and may be displayed as either white or black.

A four-digit liquid-crystal display on the main MicroVideo console can be calibrated to read out in the correct dimensional units. Newly developed Circon circuitry insures that 99.9% accuracy is maintained for all measurements on the screen.

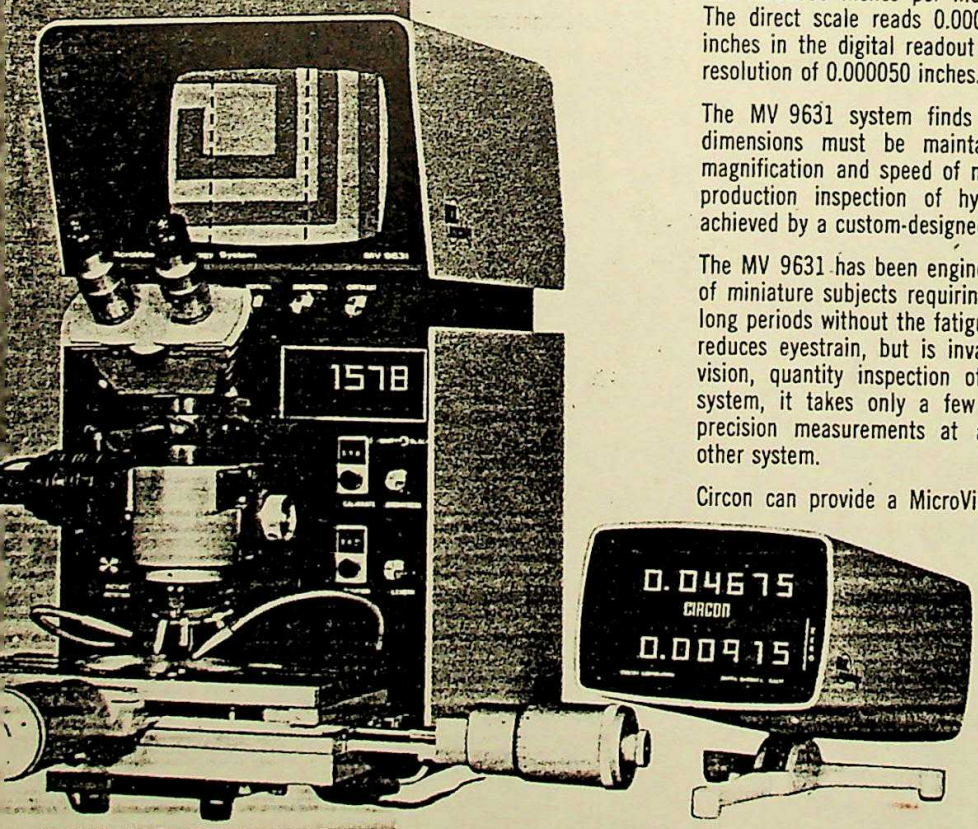
Using the second measuring system, the subject is moved across a fixed cross hair on the TV screen. When the subject's leading edge touches the cross hair, the digital micrometer readout is set to zero. As the subject traverses the screen, the distance moved is displayed on the digital readout. Width is determined by positioning the trailing edge of the subject at the same cross hair, and reading the number displayed.

The digital micrometer stage rotates 360 degrees. It is accurate to ± 0.000030 inches per inch of lead screw over a two inch travel range. The direct scale reads 0.0001 inches with vernier scales reading 0.000020 inches in the digital readout console. Each large six-digit readout provides a resolution of 0.000050 inches.

The MV 9631 system finds use wherever micro-inch tolerances on small dimensions must be maintained. Due to the ease, accuracy, power of magnification and speed of measurement, it is particularly suited for volume production inspection of hybrid and integrated circuits. Magnification is achieved by a custom-designed five turret MicroOptical system.

The MV 9631 has been engineered for maximum operator comfort. Inspection of miniature subjects requiring magnification up to 800 power is possible for long periods without the fatigue that introduces error. Screen viewing not only reduces eyestrain, but is invaluable for group examination, teaching, supervision, quantity inspection of parts and optical comparison. With Circon's system, it takes only a few minutes to train unskilled operators to take precision measurements at a rate far exceeding that available with any other system.

Circon can provide a MicroVideo system with only one of the measurement systems if the other is not required. The power of magnification can range from four to 3500x. Circon continues to develop new video and measurement systems and welcomes your statement of specifications or suggestions.



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